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Ecological Restoration:
Engaging Partners in an All Lands Approach
U.S. Forest Service, Pacific Southwest Region

United States
Department
of Agriculture
Forest Service
Pacific
Southwest
Region
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Ecological Restoration and Our Partners



Pacific Southwest Region: California, Hawai'i and U.S. Affiliated Pacific Islands

Restoring California's National Forests

California Forests Threatened Call to Action

CALIFORNIA'S FORESTS AND GRASSLANDS face serious threats from natural and human-caused stresses. Foremost threats are climate change, disturbed and altered natural systems, increases in non-native invasive species, and impacts from an expanding human population.

Over the last 75 years, climate change has resulted in many visible changes in ecological patterns and processes, changing trends in water and fire throughout California that include:

- precipitation remaining steady or increasing, trending strongly toward more rain than snow, with average annual snowpack depths decreasing,
- peak stream flow shifting to earlier in the season by three or more weeks, with lower low flows and higher high flows,
- fire frequency, size, severity and total annual burned areas rising; mostly in low to middle elevation conifers.

Climate Change Impacts

Accumulating evidence shows that a warming climate is increasing chances for extreme events like floods, droughts, heat waves and downpours. Longer and more intense heat waves and less intense cold temperatures are occurring, and the vast majority of scientific models project these patterns will intensify throughout this century. These patterns alter the frequency, intensity and timing of events such as fires, heavy precipitation and insect infestations.

Science indicates that the geographic distributions of many plant and animal species in California are changing (moving uphill or to cooler locations) and the interaction between rising temperatures and more profound summer drought is stressing watersheds.

Critical benefits we receive from California forests are threatened by climate change. These include *provisioning* services such as water, wood and wild foods; *regulating* services such as erosion, flood and climate control; and *cultural* services such as outdoor recreation, spiritual renewal and aesthetic enjoyment. The Forest Service is weaving climate change responses into policies, processes and partnerships nationwide.

Effects on Water Supply

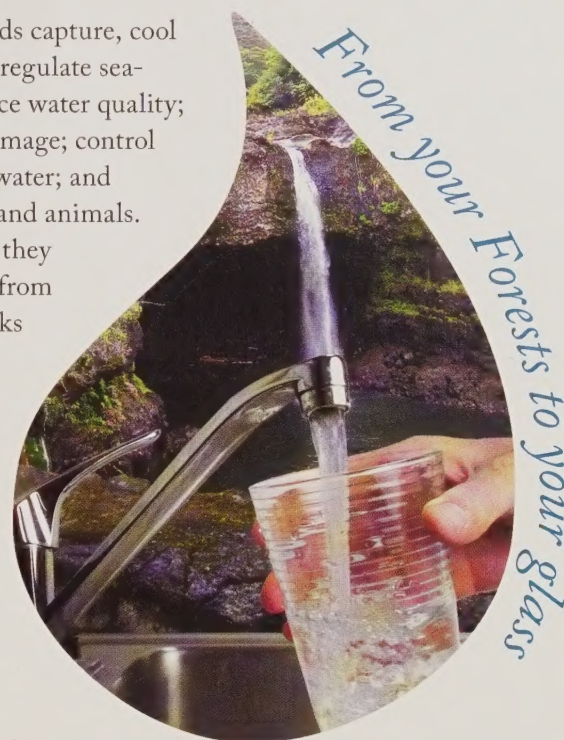
Climate change is expected to intensify issues of freshwater scarcity and conflict. California's National Forests are vital in protecting and sustaining the state's watersheds to ensure that surface water supplies meet the needs of present and future generations.

Where California Gets Half of its Water

With fifty percent of California's water originating on National Forest lands, water and watersheds valued at more than 9.5 billion dollars are among the most valuable ecosystem services California's National Forest lands deliver.

Healthy forest watersheds capture, cool and store water; naturally regulate seasonal stream flows; enhance water quality; reduce flood and storm damage; control erosion; replenish groundwater; and provide habitat for plants and animals. When forests are healthy, they resist and recover quickly from floods, fire, insect outbreaks and other extreme events.

California's National Forest's water supply sustains the state's thriving agricultural economy—the world's fifth largest supplier of food and commodities, valued at \$37.5 billion. Water from National Forests produces 16 billion kilowatt hours of renewable hydroelectric power, valued at \$1.6 billion.



FACT: About 80 percent of our nation's scarce freshwater resources originate on America's forests, which cover about one third of our nation's land area.

Restoring California's Forests The Restoration Mission

Restoring, enhancing and maintaining the health of our nation's forests benefits the environment and creates jobs in rural communities. Increasing the pace and scale of restoring forests is critically needed to address fire, climate change, bark beetle infestation and other threats—for the health of our forest ecosystems, watersheds and forest-dependent communities.

The Forest Service is committed to implementing and facilitating restoration work on our National Forests and Grasslands. We are committed to including state, tribal, and private lands, working with partners in what we call an "all-lands" approach.

Building Watershed Resiliency—Water: the Essence of Life

The cost of restoring California's National Forest watersheds is about \$300 million a year—a good investment considering restoration ensures the continued flow of water valued at \$9.5 billion per year to downstream users.

The diverse restoration work needed to build healthy, resilient watersheds includes:

- Restoring meadows, wetlands and floodplains to improve natural storage, reduce flood hazards, prolong seasonal flows, while moderating changes in stream temperature to improve aquatic and terrestrial habitat,
- Removing migration barriers and reestablishing habitat connections to help species adapt to changing conditions,
- Reducing flood and wildfire risks in vulnerable watersheds to prevent erosion and maintain clean water supplies,
- Improving or decommissioning of roads to reduce erosion during adverse weather events.

FACT: Ecological restoration results will increase benefits to citizens in the form of improved delivery of clean water, recreation, and biodiversity from our National Forests.

California Average Annual Precipitation



The Forest's Bounty Services and Products

National Forests provide these benefits to the American people:

- Delivery of clean water
- Fish, wildlife and plant habitat
- Mitigate droughts and floods
- Wood products, biomass energy
- Sustainable green economic activity
- Scientific research
- Rural economic health
- Biodiversity
- Carbon sequestration
- Air quality
- Cultural and spiritual inspiration, healing, and restoration
- Outdoor recreation
- Scenic beauty

By the Numbers

50% of California's water comes from National Forest lands.

20% of California is National Forest lands.

\$37 BILLION in food and commodities produced in California's agriculture economy is supported by water that flows from National Forest lands.

16 BILLION kilowatt hours of the state's electricity—valued at \$1.6 billion—are produced by forest water for hydroelectric power and manufacturing.

\$9.5 BILLION the value of water from National Forest lands.

38 THOUSAND jobs in the outdoor recreation industry are produced by California's National Forests.

FACT: Carbon dioxide uptake by forests in the contiguous United States offsets 11 percent of total carbon dioxide emissions.

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Why now?

We are seeing and measuring impacts of environmental stressors—our forests are unhealthy. Major drivers are: climate change, shifting weather and precipitation patterns, increasingly dense and unhealthy forests, and fast-growing human populations. We see increasing demand for water, while both water and biomass remain undervalued as commodities. We see a dramatic increase in events such as large-scale wildfires, floods, insect and disease outbreaks, threats from terrestrial and aquatic invasive species, and an increasing need to revitalize rural economies in California, Hawai'i and the U.S. affiliated Pacific Islands.

Science tells us that if we want to restore our Forests to a healthy and resilient state, we must act now to make an impact.

Carbon emission—are we losing the climate change battle?

CARBON SEQUESTRATION National Forests are some of the most efficient and readily available carbon sinks on earth. Helping young forests become established, grow, and resist adverse effects of fire, drought and mortality from insects and diseases—helping old forests resist these stressors—will optimize carbon sequestration capabilities. Through reforestation and restoration, we expect to increase carbon sequestration and optimize retention of carbon stocks.

Don't forest watersheds repair themselves? Why do they need help?

MANAGEMENT OF FOREST VEGETATION While fire is an essential component of a sustainable forest, current conditions lead to abnormally severe wildfires and long term damage for watersheds. This significantly affects ecological restoration, community wildfire protection and watersheds. Successful vegetation fuels treatments slow the spread and reduce the intensity of advancing wildland fires. The Forest Service is working to change abnormal wildfire severity, through projects that reduce hazardous vegetation.

The Agency strives to reduce the millions of tons of forest fuels produced annually on public and private lands in California. Through thinning vegetation, we can reduce the severity of wildfires and reduce competition among trees, creating greater water flow and reducing stress on the forest.

When we use biomass treatment facilities for vegetation thinning projects, we have the added benefit of turning wood into energy.

What are the benefits of biomass?

SUCCESSFUL USE OF BIOMASS In addition to promoting healthy resilient forests and more fire safe communities, the use of biomass reduces land fill waste, improves air quality, and creates five jobs per megawatt of energy produced. Biomass energy cycles carbon to the atmosphere that plants absorbed in recent past, resulting in no net release of carbon, if overall forests are stable or increasing. Biomass is an expandable technology and helps America reach energy independence.

For a long-term, successful biomass industry, a reliable and sustainable supply of biomass is needed. In California we are working with various agencies to facilitate treatment, planning and implementation for a predictable supply of woody biomass from public and private lands.

What additional tools are being used to restore forests?

TRIBAL RELATIONS AND PARTNERSHIPS The Forest Service consults and collaborates with Native American tribes, tribal governments, traditional practitioners and their communities to appreciate and benefit from thousands of years of traditional ecological knowledge gained from their stewardship of all lands in California. These collaborations will enrich the agency's design, implementation, success and longevity of forest and watershed restoration projects.

How is the agency working to reduce climate change impacts?

SUSTAINABLE OPERATIONS As the Forest Service maps out a second century in the midst of a changing climate, our choices about resource use and impacts on people and the environment are at the heart of sustainability. In the Pacific Southwest Region, the Forest Service is reducing the carbon footprint of our operations by using virtual technology to reduce travel, and establishing local green teams to find ways to reduce energy, water, and waste. Our new facilities are embracing renewable energy, including solar technology and buildings that meet LEEDS standards.

As part of our commitment to sustainable operations, the Region hosted a

completely virtual three day Sustainable Operations summit that brought leaders in sustainability from across the nation, saving almost \$1 million in travel and conference costs while avoiding 600 metric tons of carbon emissions.

Who will continue the work it will take to restore our forests?

GREEN JOBS, YOUTH, AND GREEN CAREERS The Forest Service continues to engage youth from all walks of life to foster and recruit a diverse and multi-generational workforce. We have committed to connecting kids with nature and the outdoors.

We provide students, parents and teachers with youth-oriented natural resource and environmental materials. We promote having fun outdoors, being healthy and learning more about nature. We believe these outdoor experiences create an awareness and value of public lands, provide opportunities to be future stewards of these lands, or pursue careers in natural resources management.

FACT: Woody biomass provides important ecological functions such as soil organic matter, nutrient cycling, hydrological functioning, and coarse debris for wildlife habitat.

FACT: Biomass generates five jobs per megawatt produced.

"Ecologically healthy, resilient, and biodiverse landscapes, will have greater capacity to adapt and thrive in the face of natural disturbances and large scale threats to sustainability... such as those driven by changing climates and increasing human use."

Randy Moore, Regional Forester

Working Now for Tomorrow —Creating Alliances

ALLIANCES AND PARTNERSHIPS supporting restoration projects will assist us and secure the future for our grandchildren's grandchildren. In building California forest resiliency, we will need to increase the amount of acres restored from 200,000 to about 500,000 a year. To accomplish this, we will need an investment of at least \$300 million a year. This investment could save \$800 million annually in direct cost avoidance in suppressing fires, with a savings in billions of dollars in overall resources protected, including water, property and wildlife habitat.

Existing and future partnerships with other federal, state, local and tribal entities are critical to increasing the pace and scale of restoration. Only with participation from the public can we truly manage and protect these invaluable forest resources.

Our youth will be the recipients of the bounty produced by today's restoration efforts. It is essential to continue to engage this generation to participate and partner with us to restore resilience to our nation's forests.



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Connecting for Success—Become a Partner

For more than 100 years, the Forest Service has worked together with partners to restore and protect the land. Land steward partnerships reflect a growing and important trend—the joining of passion and resources by committed citizens, organizations, businesses, tribes, and government agencies to achieve social, economic and ecological goals.

With today's complex land management problems and more diverse public impacts, strengthening our agency with strong partners and alliances is essential to achieving success for all. We are searching for significant and successful relationships between people, tribes, organizations, businesses, private land owners, agencies and communities to work together, sharing resources and passion for the land for generations to come.

Join Us Now

The Forest Service is seeking new partnerships to increase the pace and scale of restoration objectives on National Forest lands in California. With your help in using an "all lands" approach, we can leverage our assets and resources to ensure we bring nature's benefits to all Californians.



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www.fs.usda.gov/goto/r5/Partnerships



Scan this QR Code with your mobile device to add partnership information to your contacts.

Visit Us Online

At www.fs.usda.gov/prc to find:

- Cooperative Fire Protection Program Contacts
- Interpretive Association Coordinators
- National Partnership Office
- Tribal Coordinators
- Volunteer Coordinators

Other Related Websites

ECOLOGICAL RESTORATION

www.fs.usda.gov/goto/r5/EcologicalRestoration

- Region 5 Leadership Intent
- Implementation Plan
- Regional Projects

CLIMATE CHANGE

www.fs.usda.gov/goto/r5/ClimateChange

- Region 5 Carbon Inventory Assessment
- Climate Change Resource Center
- National Climate Change Strategy

WATER

www.fs.usda.gov/goto/r5/WaterQuality



Ecological Restoration Projects

1 FireScope Monterey Los Padres National Forest

The Forest has fostered and championed a collaborative framework for managing fire across the Northern Santa Lucia Mountains and the Monterey Coast, working with 25 public and private organizations that conduct planning and compliance activities up front and at the landscape scale to increase work on the ground. The collaborative seeks to protect life and property affected by wildfire while maintaining healthy ecosystems.



6 Trout Creek Restoration Project Shasta-Trinity National Forest

Federal and state agencies, private landowners, and non-governmental organizations are partnering to restore 1.5 miles of Trout Creek. This also restores the wet meadowland ecosystem, reduces and prevents erosion, improves habitat for redband trout and other wildlife, while fostering community-supported stewardship of the watershed.



5 Indian Valley Watershed Restoration Project Eldorado National Forest

Many partners came together to restore a 500-acre meadow at the Mokelumne River headwaters. As a result, the stream can access the floodplain and spread out, reducing the water flow and re-watering a nearby meadow. The \$366,400 project funding was provided by the National Fish and Wildlife Foundation and the Coca-Cola Company.



2 Dinkey Creek Landscape Restoration Project Sierra National Forest

A 154,000-acre 30-member collaborative ecological restoration project on the Sierra National Forest and private lands in a priority watershed, has restored 4,034 acres of terrestrial habitat; improved 1,187 acres of rangeland; reduced fuels on 4,778 acres and sold 15,962 hundred cubic feet of timber.



3 Forest Aid... From Ashes to Action San Bernardino National Forest

The U.S. Forest Service and Los Angeles-based TreePeople partnered to recruit large numbers of volunteers and corporations. Over two years, 25,000 volunteers participated, resulting in more than 51,000 native seedlings planted, one of the largest volunteer-led tree planting programs in southern California.



4 Green Fire: Aldo Leopold and a Land Ethic for Our Time Pacific Southwest Region

A partnership between the Aldo Leopold Foundation, the Center for Humans and Nature, and the U.S. Forest Service produced an Emmy® award-winning film examining Leopold's thinking, renewing his idea of a land ethic for a population facing 21st century ecological challenges; with Leopold's biographer, Conservation Biologist Dr. Curt Meine as the on-screen guide.



To achieve Ecological Restoration goals, the Forest Service will need to increase the amount of acres restored in California from 200,000 acres a year to about 500,000 acres per year.

About Us

The U.S. Forest Service, Pacific Southwest Region manages 18 national forests, encompassing 20 million acres of National Forest land in California and assists the state and private forest landowners in California, Hawai'i and the U.S. Affiliated Pacific Islands.

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Rainbow Falls photo by: Nathan Tucker